

ANTECEDENTS AND CONSEQUENCES OF DAMAGED CARGO IN MALAYSIA: EXPANDING THE UNDERSTANDING ON BEST PRACTICES IN HANDLING AIR CARGO.

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ABSTRACT

Research on cargo handling has been widely discussed especially in the Western countries. Previous research has substantially discussed issue on cargo from all perspective including sea, road, rail and air. The expansive research on air cargo handling is significant to further comprehend the process of handling air cargo as aviation is recognized as a highly regulated industry. The innovation effort taken by the air cargo organization to prevent damaged cargo relates with new approach to devise strategy which lead to managerial innovation and improved organizational performance. In this study, we highlight the antecedents and consequences of the damaged air cargo products with offering some preventive measures for organizational improvement. This insightful finding from industrial viewpoints may shed light on the gaps exist between past studies and current practical realities. We finally proposed the future research opportunities of air cargo study to the future scholars.

Keywords: Cargo handling, Air cargo, Aviation Management, Damaged Cargo, Malaysia, Aviation

INTRODUCTION

With increasing demand from aviation tourism and globalization, the air cargo industry has increasingly recognized as a key vehicle to support world trade activity, as well as tourism and Halal industry across the globe (Khairuddin et al., 2018; Abdul Rahman et al., 2018; Rahim et al., 2020; Abdul Rahman et al., 2020). It is acknowledged that the demand of air cargo is closely interlinked with global economy. As mentioned by Senguttuvan (2006), air cargo demand is driven by globalization, liberalization and lean inventory. As highlighted by the International Air Transport Association (IATA) in 2020, air cargo business is grown faster than airline passengers' business, and the demand for freighter is increasingly year by year with the increased of aviation tourism activity.

With increasing demand of the tourism activity, Halal product demand worldwide, live animal shipments, special cargo item such as valuable and vulnerable product, air cargo business is becoming significant revenue generation for many airlines. It is

expected that air cargo demand will still have tonnage demand by both importers and exporters.

One of the key responsibility of the air cargo provider is to ensure the quality of its cargo is secured throughout the cargo supply chain, until it reach the receiver at the final destination. In cargo business, damaged cargo is one of the popular issue discuss among the players globally. Any damaged cargo or product will lead to the rise of product and financial loss, and also affect the good relationship between customers and their service providers. In fact, the image of the cargo provider may also have affected if the damaged cargo cases are keep happening or increasing.

This is because every customer need the right quality of products. It is acknowledged that damage to goods can occur at any stage of the operation activities from beginning till the end of the operation activities because it will involve many parties in the operation. “Damaged also can occur due to arrangement in containers or on the pallet, as well as poor packaging or build up of the cargo itself. It is vital for every player to carefully ensure its ground process at the cargo terminal, as well as cargo handling activities by their staff is aligned with its operation manual, and follow the standard operating procedure as recommended by the regulators locally and internationally.

By improving the air cargo operations, the organization can reduce damaged goods. The important things to ensure the security and safety of goods that be transported are arrangement and packaging. If poor of quality in packaging and arrangement of goods, the risk of goods to be damaged are higher.

With this background, this study is established to answer and achieved both research questions and research objectives. Table 1 below shows the research question and research objectives developed in this study.

Table 1: Research questions and research objectives developed in this study

Research Questions	Research Objectives
1. What are the key factors that contributed to cargo damaged from air cargo perspectives?	To identify the key factors that contributes to the air cargo damaged from air cargo perspectives
2. What are the best practices for air cargo handling?	To explore what are the best practices in air cargo handling

Source: Developed by the authors

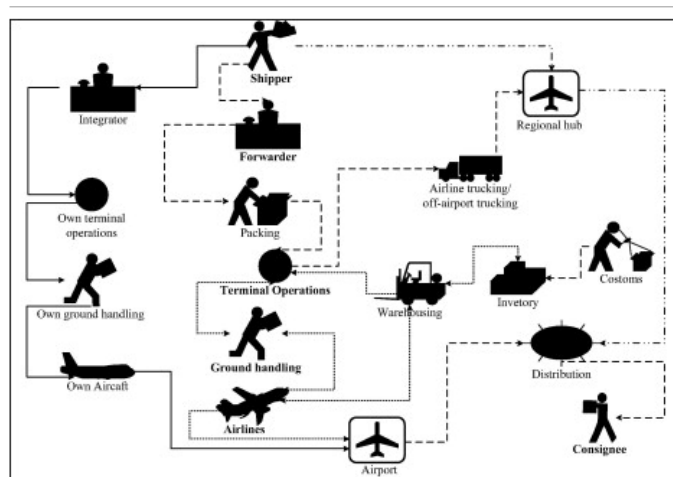
Literature Review

Overview of air cargo industry and Air Cargo Operation

In today competitive environment, air cargo plays a vital role in the air transport and tourism chain for many countries since several past years. The demand for air cargo is increasing year by year and previous studies shows the demand for cargo are various including demand for general cargo, merchandise trade, special handling cargo including live animals, dangerous goods, valuable item, overweight cargo and many more (Rahim et al., 2020; Feng et al 2015). Air cargo operation involves a series of services from origin to destination. The air cargo supply chain not only move cargo from the shipper and the airline, but also involve other parties such as freight forwarder, cargo terminal, custom, consignee, and also road transporter or known as trucker (Derigs, et al. 2009).

Below figure 1 shows the example of the cargo movement process as published in Kasilingam (2003). From this figure, it shows that the freight forwarder or the cargo agent is act as a “middle men” between the airline and also consignor to move the cargo from one point to another point. As highlighted by past studies, the airlines roles is to move the cargo via air to the destination. Additionally, the airlines or air cargo terminal are will in charge with the receiving and storage of the cargo, transfer and tracking of the cargo, loads and unloads the cargo, as well as assign and manage capacity of cargo based on aircraft configuration. While the road transporter will provide ground transportation services before and after the air transportation.

Figure 1: Air cargo movement process



Source Kasilingam (2003)

From academic point of view, the air cargo field is widely research across the globe especially in the Western countries. As highlighted by Feng et al (2015), the air cargo study starts as early as 1980s. At that time, the focus of research is mainly focus on the system description, air cargo operational process and also industry development. At

present, the focus of air cargo research has moved to more advance, quantitative and methodological issues such as methods of decision making in cargo operation, technology and computer aided decision making techniques, as well as other issues related to network and route planning, and revenue management. The next subsection will elaborate on the air cargo industry framework which consist of various players in the market.

Air cargo industry Framework: Key players in air cargo operation

There are many players involved air cargo business. The air cargo industry framework are made of several players such as the shipper, the forwarder, the airline and cargo terminal, airports, custom, as well as consignee or also known as receiver. Below table 2 shows the details of the role of each key players discussed earlier.

Table 2: Air Cargo Key Players and Its role

Key players	Shipper	Freight Forwarder	Airline / Air Cargo Terminal	Airports	Custom	Consignee
Roles/function	Make a booking, negotiates best prices, select product, preparing documents, track shipments, payments and place claims	Make booking, negotiate best rates, booking acceptance, bidding on space allotments, distribution, warehousing, preparing insurance and custom documentation, invoice, interact with other multi modal, consolidation of shipments, place claims	Schedule cargo flight, plan for cargo loading, shipment prioritization, plan for loading and cargo build up, pallet and containerization, forecast cargo capacity, set or bid prices, obtain and send flight manifest, unit load device (ULD) tracking, maximize revenue and sales, improve load factors, track shipment allocate space for cargo, resource management, validate packing and cargo package	Warehouse and storage, custom, package validation, notify captain, dangerous goods item control, safety and security clearance, help to facilitate smooth cargo movement and operations	Import and export duties	Shipments tracking, place claim and place charges if any, accept billing and make payments

Source: Developed by the researchers

Damaged Cargo

Issue on damaged cargo is interesting to discuss. Cargo is considered damaged when it is received by the consignee in a bad condition. In air cargo supply chain, there are so many parties involved in the process to get the cargo reach to destination. The different parties involved in handling the cargo may lead to cargo damage during the shipment process, and it is very possible to happen. When damaged happen, it reduces the value or usefulness of the cargo.

Qualitative Research Methodology: Interview method

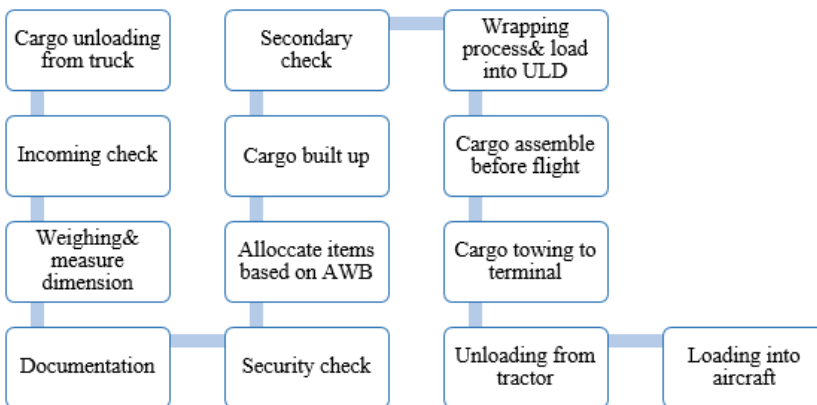
In answering the above research questions and achieving highlighted research objectives, this exploratory study adopts single case study to better understand the definition of damaged cargo. This research adopts semi structured interview method to explore issue on contributing factors to the damaged cargo and the best practices of the cargo handling activity. In this work, we interviewed two staff from the air cargo providers to understand the movement of the cargo from point of origin to the point of consumption and the possibility of cargo damaged occur during the process. The interview was made to get more clear about the cargo operation and the possibility of cargo damaged occur during both process import and export. In this study we used purposive and snowball sampling technique.

Key Findings

Overview of export and import process flow.

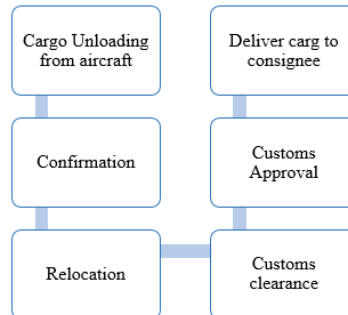
Since air cargo business involved with both import and export activities, it is important to highlight the highlight the process involved in both import and export process for air cargo process, before discussing the main findings of this study in relation to the factors that contributes to the damaged cargo in air cargo context. Below figure 2 and figure 3 illustrated the process flow involved for both import and export activity in air cargo business.

Figure 2: Export process flow in air cargo operation



Source: Developed by the authors

Figure 3: Import process flow in air cargo operation



Source: Developed by the authors

Factors contributed to Damaged cargo from air cargo perspectives

From the interview findings, all of our respondents agree that one of the key factor that contributes to the cargo damaged is human error. There are four main factors highlighted by the respondents that contributes to the damaged cargo in air cargo operation. They are human error or human behavior, vendor factor, cargo build up process and accident at the cargo terminal or warehouse. The first factor namely human error refers to the negligence of staff and also vendor. Human error commonly defined as a failure of a planned action to achieve the desired outcome. Meanwhile, plans can describe as adequate or inadequate actions or behavior. In air cargo business perspectives, human behavior or attitude also can lead to human error. The factors that can influence human attitude is experience and environmental factors. As mentioned by one of the interviewee:

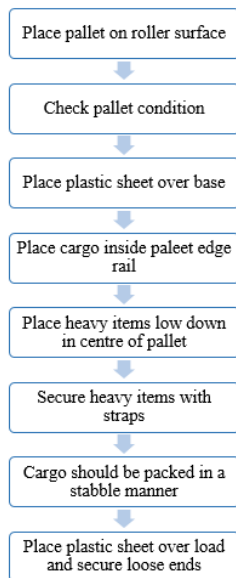
“Few of the staffs at our organization have more than six years experiences. They are confident that they know everything that what need to do due to their experiences, which sometimes refused to follow the right Standard Operating Procedure (SOP)”.

Do not follow the right SOP as documented may lead to cargo damaged to happen. As mentioned by the other interviewee, vendor is also another factor. As highlighted by one of the respondent, he mentioned:

“The negligence of vendor....the improper packaging were used and lead failure in protecting the cargo from damaged during the transportation”.

Other than that, cargo damaged normally happen during build up. They should ensure that they manage cargo according to their types, sizes and weight to avoid any damage. Cargo damaged in this operation happen because of the sometimes the cargo not build up according to their size and weight. Figure 4 below show the pallet build up process need to follow this process to avoid cargo damaged.

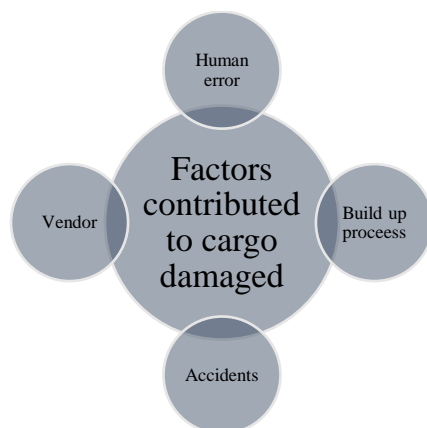
Figure 4: Pallet Build Up Process in Air Cargo



As highlighted by the respondent, the cargo damaged also happen due to the cargo accidentally toppled and may be hit by forklift. This happen due to the improper packaging used. The packaging used is important for physical protection because the cargo required protection from, among other things, temperature and vibration. Moreover, packaging is important as information transmission. Packaging and labels communicate how to use and transport. The cargo should be packed based on their types to avoid any cargo accidentally toppled during the operation and can manage used the appropriate handling. Moreover, staff need to have training before they handle this operation because if damage happen, it will impact on satisfaction of customers. To summarize, figure 5 below shows the four main factors that contribute to cargo damaged in air cargo

Source: Developed by the authors

Figure 5: Factors that leads to cargo damaged in air cargo



Source: Developed by the authors

The next subsection will elaborate on the best practices in air cargo handling as suggested by the industry respondents.

Best Practices for Air Cargo Handling

It is acknowledged that cargo handling is the activity of moving goods or cargo on and off ships, aircraft, trucks and others. Nowadays, many of airlines used advanced systems for cargo handling. For air cargo organization, the systems used for cargo handling helps to organize loading and unloading of cargo with more effective in cost, time saving, more secure, safe and reliable. The other best practices are never skip the SOP that is already documented in our organization. It is vital to follow the process of loading and unloading cargo. Besides it, as discussed in our findings, one of the important best practices is to always do counter check for all the cargo before loading. It is important to check all the cargo before loading to ensure there is no damaged or the cargo in low quality. If there is any damaged cargo delivered to the arrival airport, penalty will be charged. Besides it, another good practices is to always do pieces counted accurately to ensure the exact number cargo is delivered according to the request from agents. If there is not enough quantity, the air cargo organization need to bear the cost or bear the delivery cost of the remaining missing cargo. As highlighted by our respondents, another important things is best practices with regards to material handling. This is vital to ensure the effectiveness of the operation and the safety of cargo. Materials such as plastic sheets, stretch films and lashing are the common material used in any air cargo operation. It is significant to ensure every types of cargo used accurate material handling especially for those who handling special goods or special cargo.

Conclusion and Recommendations

This study identified several significant inoput related to cargo damaged in the air cargo operation and management. To conclude this study, there are two main point that is noteworthy. The first one is to uphold good quality in handling activity throughout air cargo operation process is a responsible for every parties involved, and secondly the use of related technology in every air cargo supply chain activity may lead to reduce the risk of cargo damaged to be happened. As recommended by past study, the use of technology such as RFID improved cargo tracking system and facilitated the visibility and the condition of the air cargo throughout the supply chain (Gontarz et al., 2015). With current condition of pandemic covid 19, this study also like to recommend for future studies to explore on the impact of covid 19 pandemic on air transportation business and air cargo operation and management.

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